

## PATENT ABSTRACTS OF JAPAN

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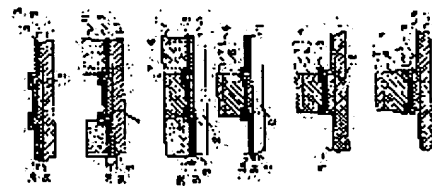
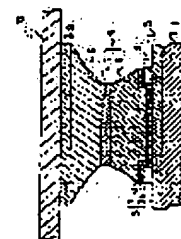
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## (54) SEMICONDUCTOR DEVICE AND ITS CONNECTING METHOD

## (57)Abstract:

PURPOSE: To relax a stress caused by a thermal stress at the interface between a bonding pad and a bump and to form a strong connecting structure by a method wherein a layer by a first metal or alloy and a layer by a second metal or alloy whose melting point is higher than that of the first metal or alloy are formed sequentially on the bonding pad.

CONSTITUTION: A wafer on which an opening has been made in a resist layer 11 in a part corresponding to a bonding pad 2 is plated with a Pb/Sn=60/40 alloy 6 and, then, with a Pb/Sn=95/5 alloy 7. The resist layer 11 is removed. Regions in which the Pb/Sn alloys 6, 7 have been formed are masked with a positive resist in an island shape; a Cu film 3b and a Ti film 3a are etched and removed; the mask is removed by using acetone. After that, a reflow operation is executed at 280°C which is lower than the melting point of the second metal 7 and higher than the melting point of the first metal 6. Thereby, a semiconductor device having a desired bump structure is obtained. In order to connect the semiconductor device to a substrate, a third metal layer 8 whose melting point is lower than that of the second metal layer 7, e.g. a metal layer 8 by Pb/Sb=60/40, is formed selectively on the second metal layer 7; the third metal layer 8 is brought into contact with a corresponding pad on the substrate; at least one out of the third metal 8 and the first metal 6 is heated and melted at a temperature which is lower than the melting point of the second metal 7.



## LEGAL STATUS

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